Selection systems for late leaf spot resistance in groundnut (Arachis hypogaea L.)

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INTRODUCTION

Foliar diseases particularly leaf spots and rust are the major factors limiting yield and quality in groundnut. Most of the groundnut cultivars in India are highly susceptible to foliar diseases. Usually in India, all these diseases occur together causing yield losses up to 70 per cent (Hegde et al., 1995). But late leaf spot is more prevalent and damages the plant by reducing the available photosynthetic area by lesion formation finally stimulating leaflet abscission leading to extensive defoliation and hence affecting both quantity and quality of haulms. Fungicidal sprays are effective in controlling these diseases, but the use of disease-resistant cultivars is a better approach. A number of resistant germplasm lines are available but many other undesirable attributes limit their utility as cultivars. Attempts have been made to produce high yielding disease resistant cultivars through hybridization, but the lines developed either had only moderate resistance or retained one or more undesirable features. Early generation testing for yield and other characters is an alternative method to accelerate generation advance, which considerably reduces the cost of the whole improvement programme by reducing the input of labour and management. Acceptable breeding lines were selected by using early generation trials in groundnut (Cofflet and Hammons, 1974). The objective of the present study is to evaluate suitability of selection schemes in early generation for producing productive segregants with resistance to late leaf spot and desirable agronomic features.

MATERIALS AND METHODS

Two widely cultivated Spanish bunch varieties but susceptible to late leaf spot disease (TMV2 and JL 24) were used as female parents and two resistant germplasm lines (RMP 12 and PI 393516) were used as male parents (Motagi et al., 1999). Single and multiple crosses viz., back, three-way...